



International Conference on

# Science & Geopolitics of Arctic & Antarctic

March 9 - 11, 2012, New Delhi

i-SAGAA 2012 SUPPORTED BY

MINISTRY  
OF  
EARTH SCIENCES



सत्यमेव जयते

DEPARTMENT  
OF SCIENCE AND  
TECHNOLOGY



सत्यमेव जयते

NATIONAL CENTRE  
FOR ANTARCTIC AND  
OCEAN RESEARCH



COUNCIL OF SCIENTIFIC  
AND INDUSTRIAL  
RESEARCH



INDIAN COUNCIL  
FOR AGRICULTURAL  
RESEARCH



KNOWLEDGE PARTNER



EXHIBITORS



GEOLOGICAL  
SURVEY OF INDIA



CENTRAL INSTITUTE  
OF FISHERIES  
TECHNOLOGY



CENTRAL MARINE  
FISHERIES RESEARCH  
INSTITUTE



NORINCO PRIVATE  
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WADIA INSTITUTE  
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GEOLOGY



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# the i-SaGAA delegates

1. Shailesh Nayak, **Chief Guest**  
Secretary, MoES

2. P. S. Goel, **Guest of Honour**  
Chairman, RAC, DRDO

## organising committee

3. P C Pandey, Professor Emeritus,  
Center for Ocean, River, Atmosphere  
and Land Sciences, IIT Kharagpur;

4. Rasik Ravindra, Director, National  
Centre for Antarctic and Ocean  
Research, Goa;

5. Klaus Dodds, Professor of  
Geopolitics, University of  
London, UK;

6. Sanjay Chaturvedi, Professor,  
Center for Study of Geopolitics,  
Department of Political Science,  
Panjab University, Chandigarh;

7. S Shivaji, Senior Scientist, Center  
for Cellular and Molecular Biology,  
Hyderabad.

8. R Ramesh, Senior Professor and  
Project Director Physical Research  
Laboratory, Ahmedabad;

9. A K Gwal, Head, Department of  
Physics, Barkatullah University,  
Bhopal;

10. V Sampath, Former Advisor, MoES,  
New Delhi;

11. R K Sharma, Advisor, MoES,  
New Delhi.

12. M Sudhakar, Advisor,  
MoES, New Delhi.

## LIGHTS secretariat

13. Dr. D. P. S. Seth, Chairman,  
Organising Secretariat

14. Sulagna Chattopadhyay,  
Convenor, Organising Secretariat

15. S. Srinivasan, Member

16. N. Prasad, Member

17. Saraswati Raju, Member

18. Shashi Bhushan, Member

19. Krishma Seth, Officer

20. Madhusmita Giri, Officer

21. Ankita Sah, Officer

22. Shilpa George, Officer

23. Anil Panwar, Technician

24. Nilesh Kumar, Technician

25. Binod Rawat, Technician

26. Dhruv Pandey, Technician

27. Sadaqat Khan, Technician

28. A. L. Ramanathan, Professor, SES, JNU

29. A. Lozaanba Khumbah, Student, JNU

30. Abhinav Srivastava, Junior Research  
Fellow, University of Allahabad,  
Allahabad

31. Ajai Saxena, Chief Conservator of Forests  
and Principal Secretary in Andaman &  
Nicobar Administration

32. Ajit Tyagi, Former, DGM, IMD

33. Amit Dharwadkar, Snr Geologist, GSI

34. Amit Mandal, Geologist, GSI

35. Anand Mohan, Registrar, Dyalbagh  
Educational Institute, Agra

36. Anil Gupta, Director, WIHG

37. Ankita Singh, Student, Miranda House

38. Anshumala Verma, Chief Executive,  
C. N. Technology Pvt. Ltd.

39. Ashit Kumar, Geologist, GSI

40. B. Meenakumari, DDG, Fisheries  
Division, ICAR

41. Balakrishnan P, Student, JNU

42. Balwant Raj Bhadawar, Research Scholar,  
Agra

43. C. N. Ravishankar, Principal Scientist &  
Head, Fish Processing Division, CIFT

44. C. G. Deshpande, Scientist D, IITM, Pune

45. Charumita Vasudev, Student,  
Miranda House

46. D. P. Dobhal, Scientist, WIHG

47. Deepika Saraswat, Research Scholar JNU  
48. Evy Mehzabeen, Student,  
Miranda House

49. Gaurav Kumar, Research Scholar, JNU

50. Gaurav Raghubanshi, Student, IGNOU

51. George John, Advisor, Department of  
Biotechnology

52. Jai Prakash Chaubey, Space Physics  
Laboratory

53. John M. Reynolds, MD, Reynolds  
International Ltd., UK

54. John P. Bowman, Associate Professor,  
University of Tasmania

55. John Turner, Deputy Secretary General,  
British Antarctic Survey, Cambridge

56. Kashif Jameel, Student,  
Jamia Millia Islamia

57. L. S. Rathore, DGM, India Meteorological  
Department

58. Luther Rangreji, Asst. Prof., SAU

59. Mahashweta Mukherjee, Student, Kirori  
Mal College

60. Maria Judith Gonsalves, NIO, Goa

61. Nalan Koc, Research Director, Norwegian  
Polar Institute

62. Nityanand Singh, Scientist F & Head,  
Climato-Hydromet Division, IITM

63. P. A. Loka Bharathi, Chief Scientist, NIO

64. Pooja Yadav, Student, Miranda House

65. Pradeep Kumar, Geologist, GSI

66. Pravin Puthra, Sr. Scientist, CIFT

67. R.P.Lal, Director, IMD

68. Rani Kumari, Student, Miranda House

69. Rita Sharma, British High Commission,  
New Delhi

70. Ruchi Gamta, Student, Hindu College

71. S K Tandon, Former, Pro-Vice Chancellor,  
University of Delhi

72. S. K. Parcha, Scientist, WIHG, Dehradun

73. S. Mukherjee, Former Head,  
Faridabad, GSI

74. S. Rajan, Project Director, NCAOR

75. S. S. Deora, Professor, CIPOD, JNU

76. S. W. A. Naqvi, Outstanding Scientist,  
NIO

77. Sakshi Sharma, Student, Miranda House

78. Saleha Sapra, Student, Kamla Nehru  
College

79. Sandip Oza, Scientist/ Engineer SAC,  
Ahmedabad

80. Sangeeta Kumari, Student, Miranda  
House

81. Sanjay Bist, IMD

82. Sarita Ghai Kumar, Associate Professor,  
Kamla Nehru College

83. Sarita Swani, Student, Kamla Nehru  
College

84. Savita Kerkar, Associate Professor,  
Department of Biotechnology, Goa  
University

85. Shree Verma, CEO, C N Tech

86. Shweta Rani, Research Scholar, Delhi  
School of Economics

87. Sneha Kishore, Student, Miranda House

88. Sneha Chakrabarti, Student,  
Miranda House

89. Sukant Vatsa, Student, Gorakhpur  
University

90. Swashpawan Singh, Former Ambassador  
& Permanent Representative of India to  
the United Nations, Geneva

91. Swati Basu, Director, NCMRWF, MOES

92. T. Meloth, Scientist, NCAOR, Goa

93. Timo Koivuova, Director, Northern  
Institute of Environment & Minority Law,  
University of Lapland

94. Uma Dey Sarkar, Student,  
Miranda House

95. Utsav Sharma, Student, Kirori Mal  
College

96. V. K. Soni, IMD

97. Victor Smetacek, Alfred Wegener IPMR,  
Germany

98. Vijay Sakhujia, Director, ICWA

99. Ximena Alcayaga, Embassy of Chile



The National Centre for Antarctic and Ocean Research (NCAOR) - an autonomous R&D Institution under Ministry of Earth Sciences (MoES), is the nodal agency coordinating and implementing the Indian Polar (Arctic, Antarctic and Southern Ocean) Programme. This year NCAOR has proudly completed the First ever Indian Expedition to South Pole, led by its Director, Rasik Ravindra and comprising Ajai Dhar, Ashit Swain, Javed Beg, Pradip Malhotra, Thamban Meloth, Krishnamoorthy and Surat Singh. India has also successfully launched 30 scientific expeditions to Antarctica and 4 expeditions each to Arctic and Southern Ocean till now under the stewardship of MoES & NCAOR.

Apart from Maitri in Antarctica, India now has a research Base – Himadri – in Arctic. A new research base, named Bharati, is coming up at the Larsemann Hill region of eastern Antarctica. Process for acquisition of a Polar Research Vessel has already been initiated. India now has direct connectivity with Antarctica for real time data and voice transmission, NCAOR is the only institute in the country that has the capability to raise, archive and process ice cores from polar regions.



## **NATIONAL CENTRE FOR ANTARCTIC AND OCEAN RESEARCH**

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<http://ncaor.nic.in>

11.30 am - 1.30 pm

**Curriculum Initiatives and Careers in Arctic and Antarctic Studies**

IIC - Extension New Building, Seminar Hall 1&2

Presided by **Dr. P. S. Goel**, Chairman, RAC,  
Defence Research and Development Organisation, New Delhi

**International Panelists:**

Prof. John Turner, British Antarctic Survey, UK

Dr. Timo Koivurova, Director, Northern Institute of Environment & Minority Law, University of Lapland, Finland

Dr. Victor Smetacek, Alfred Wegener Institutes for Polar and Marine Research, Germany

Dr. John P. Bowman, Associate Professor, University of Tasmania, Australia

Prof. Nalan Koc, Research Director, Norwegian Polar Institute, Norway

Prof. John M. Reynolds, Managing Director, Reynolds International Limited, UK

**National Panelists:**

Dr. George John, Advisor, Department of Biotechnology, New Delhi

Rasik Ravindra, Director, National Centre for Antarctic & Ocean Research, Goa

Dr. M. Sudhakar, Advisor, Ministry of Earth Sciences, New Delhi.

Dr. S. Shivaji, Scientist, Centre for Cellular and Molecular Biology, Hyderabad

Dr. Ajit Tyagi, Former Director General, India Meteorological Department, New Delhi

Discussion with students and representatives from UGC, NCERT, IGNOU etc.

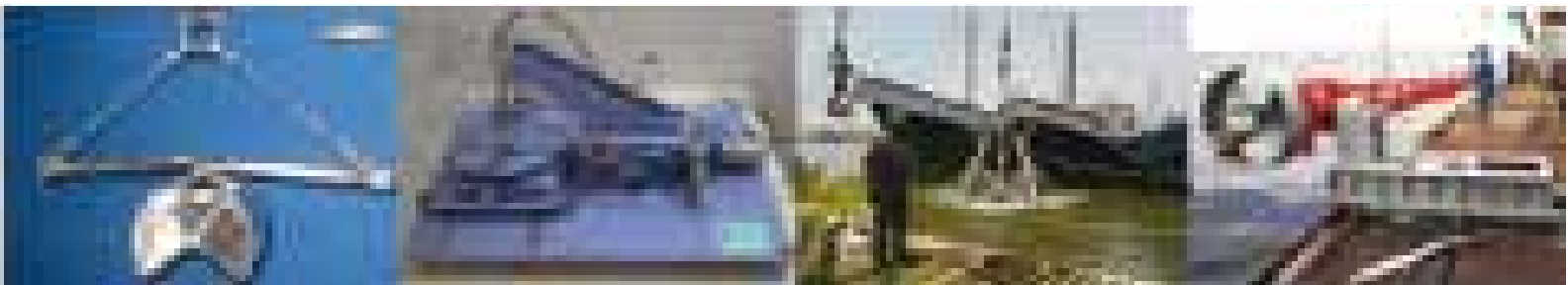




# Science and Technology

**Department of Science & Technology**  
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Indian Science has come to be regarded as one of the most powerful instruments of growth and development. In the wake of the recent developments and the new demands that are being placed on the science and technology system, it is necessary for us to embark on some major science projects which have relevance to national needs and which will also be relevant for tomorrow's technology. The Department of Science and Technology plays a pivotal role in promotion of science and technology in the country. The Department has wide ranging activities ranging from promoting high end basic research and development of cutting edge technologies on one hand to service the technological requirements of the common man through development of appropriate skills and technologies on the other.



Norinco is a leading manufacturer of Oceanographic research equipment. Our well experienced oceanographic team consists of Electronic and Mechanical Engineers who design and fabricate standard and custom designed sampling gears, data acquisition systems and equipment packages for the scientific community in the country. All under water equipment developed by Norinco are field proven and used from coastal regions to deep ocean.

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2.30 - 3.30 pm	Inauguration
Venue	IIC - Extension New Building, Seminar Hall 1&2
2.30 - 2.35 pm	Welcome Address by Dr. D. P. S. Seth, Chairman, Organising Secretariat - LIGHTS, Former Member, TRAI, and Ex-officio Secretary, Department of Telecommunications, Government of India, Former CMD, BSNL
2.35 - 2.40 pm	Address by Dr. Victor Smetacek, Alfred Wegener Institute for Polar and Marine Research, Germany
2.40 - 2.45 pm	Address by Rasik Ravindra, Chairman, Organising Committee, Director, National Centre for Antarctic & Ocean Research, Goa
2.45 - 2.50 pm	Address by Prof. John Turner, British Antarctic Survey, UK
2.50 - 3.05 pm	Keynote Address by Dr. P. S. Goel, Chairman, RAC, Defence Research and Development Organisation, New Delhi
3.05 - 3.25 pm	Chief Guest Address by Dr. Shailesh Nayak, Secretary, Ministry of Earth Sciences, Govt. of India, New Delhi
3.25 - 3.30 pm	Vote of thanks by Sulagna Chattopadhyay, President, LIGHTS Research Foundation, Convenor i-SaGAA 2012
	Distinguished guests attending the inaugural session are Swashpawan Singh, Former Ambassador and Permanent Representative of India to the United Nations in Geneva, Dr. B. Meenakumari, Deputy Director General (Fisheries), Indian Council of Agricultural Research, New Delhi; Dr. L. S. Rathore, DGM, Indian Meteorological Department; Dr. Ajit Tyagi, Former DG, Indian Meteorological Department; Dr. George John, Advisor, Department of Biotechnology, New Delhi; Dr. Anil K. Gupta, Director, Wadia Institute of Himalayan Geology, Dehradun; Dr. Swati Basu, Scientist G, Advisor, MoES and Director, NCMRWF, New Delhi; Dr. M. Sudhakar, Advisor, Ministry of Earth Sciences, Govt. of India, New Delhi
3.30 - 4.00 pm	Tea break

Theme A	Geopolitics: UNCLOS and the Global Commons Geopolitics of the Global Realms
Venue	IIC - Extension New Building, Seminar Hall 1&2
4.00 - 6.00 pm	CHAIR : Swashpawan Singh, Former Ambassador and Permanent Representative of India to the United Nations in Geneva
Paper presentations	CO-CHAIR : Dr. Timo Koivurova, Director, Northern Institute of Environment & Minority Law, University of Lapland, Finland
	Geopolitics of Knowledge and Future of Antarctic Governance Dr. Sanjay Chaturvedi, Professor of Political Science at Punjab University and Coordinator, Centre for the Study of Geopolitics, Chandigarh
	Impact of Climate Change on Circumpolar Regions and Geopolitical Implications Prof. S. S. Deora, Jawaharlal Nehru University, New Delhi
	Politico-strategic Developments in the Arctic Region Dr. Vijay Sakhuja, Director, Indian Council of World Affairs, New Delhi
	Arctic is warming- can the Arctic Council counter the vast challenges ahead? Dr. Timo Koivurova, Director, Northern Institute of Environment & Minority Law, University of Lapland, Finland
	Applicability and Efficacy of Indian Environmental Laws in Managing High Seas and Antarctic Ajai Saxena, Addl. Pr. Chief Conservator of Forests, Dept of Environment & Forests, Andaman & Nicobar Administration, Port Blair



The Council of Scientific & Industrial Research

**MISSION**

To provide scientific industrial R&D that maximises the economic, environmental and societal benefits for the people of India.



The premier industrial research and development organisation in India was constituted in 1942 by a resolution of the then Central Legislative Assembly. The Council of Scientific and Industrial Research (CSIR) is an autonomous body registered under the Registration of Societies Act of 1860. CSIR is a client-oriented, performance-driven and accountable organization actively involved in generation of knowledge and technologies, development of product or process and also its transition to the marketplace. With its extensive resource base, core competence that cuts across the entire spectrum of science, innovative and skilled manpower, cost-effective solutions, and adherence to strict time frames, CSIR has always exceeded the demands made on it.

Council of Scientific and Industrial Research  
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**The Geological Survey of India (GSI)**, the second oldest survey in the country was established in 1851 with the singular aim to locate coal for the railways. GSI over the years has expanded its role to undertake elucidation of the geological set up of the country, including assessment and regional level exploration for coal and other mineral resources, inputs to engineering projects, geotechnical studies, geo-environment and natural hazards, glaciology, seismotectonics etc.

GSI is the prime provider of basic earth science information to the government, industry and the general public, as well as responsive participant in international geoscientific fora. The vibrant steel, coal, metals, cement and power industries which expanded phenomenally in the post-independence era, bear eloquent testimony to the GSI's relevance in the national context.



**Geological Survey of India**

Antarctica Division, Geological Survey of India  
NH 5P, NIT, Faridabad - 121001.  
[antgsi@gmail.com](mailto:antgsi@gmail.com)

Date: **10 March 2012**

<b>Theme B I</b>	<b>Biotechnology: Microbial resources in Polar Regions Dynamics in Polar Marine Biodiversity (Prokaryotes, vertebrates and invertebrates) Information Exchange and Intellectual Property Rights, Resources of the Southern Ocean</b>
<b>Venue</b>	IIC - Extension New Building, Seminar Hall 1&2
<b>10.00 - 11.30 am</b>	CHAIR : Dr. George John, Advisor, Department of Biotechnology, New Delhi CO-CHAIR : Dr. S. Shivaji, Centre for Cellular and Molecular Biology, Hyderabad
<b>Paper presentations</b>	Genomics, functionality and ecology of closely related true versus 'part-time' Psychrophiles of Antarctic Dr. John P. Bowman, Associate Professor, University of Tasmania, Australia Cold Loving Bacteria from Antarctic and Arctic: Occurrence, Survival and Usefulness Dr. S. Shivaji, Scientist, Centre for Cellular and Molecular Biology, Hyderabad Harnessing the biosphere to mitigate global climate change and sea level rise Dr. Victor Smetacek, Alfred Wegener Institute for Polar and Marine Research, Germany
<b>11.30 - 11.45 am</b>	Tea Break
<b>Theme B II</b>	IIC - Extension New Building, Seminar Hall 1&2
<b>11.45 am - 1.30 pm</b>	CHAIR : Dr. Victor Smetacek, Alfred Wegener Institute for Polar and Marine Research, Germany CO-CHAIR : Dr. P. Bowman, Associate Professor, University of Tasmania, Australia
<b>Paper presentations</b>	Importance of contextual information for harnessing microbial resources from polar regions Dr. P. A. Loka Bharathi, Chief Scientist, National Institute Of Oceanography, Goa Psychotropic Metal Tolerant Bacteria for Mobilisation of Metals Maria Judith Gonsalves, National Institute Of Oceanography, Goa Antarctic Krill Harvesting- Indian Experience Dr. B. Meenakumari, Principal Scientist, Central Institute of Fisheries Technology, Cochin The Effect of a Temperature Rise on the Sulfate Reducing Rates in Cold Marine Sediments of Kongsgforden (Svalbard, Arctic Ocean) Dr. Savita Kerkar, Goa University, Goa Post Harvest Technological Aspects of Antarctic Krill Euphausia Superba Dana Dr. C.N. Ravishankar, Principal Scientist, Central Institute of Fisheries Technology, Cochin Squid Jigging Operations in the Southern Ocean Dr. Pravin Puthra, Senior Scientist, Central Institute of Fisheries Technology, Cochin
<b>1.30 - 2.30 pm</b>	Lunch break





**The Central Marine Fisheries Research Institute** established by the Government of India under the Ministry of Agriculture in 1947 became a member of the Indian Council of Agricultural Research (ICAR) family in 1967. The headquarters was shifted from Mandapam Camp to Cochin in 1971.

Over the period, the Institute has grown significantly in its size, stature & research infrastructure. Now, it enjoys the status of a premier research organisation comparable to any similar institution in the developed countries.

With the fast changing marine fisheries scenario and emergence of mariculture as a viable proposition for enhancing the production, the Institute over the years has tuned its mandate in consonance with the needs of the time.



Central Marine Fisheries Research Institute  
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Phone: 0484 2394357, 2391407  
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(Indian Council of Agricultural Research)  
CIFT Jn., Matsyapuri P.O., Willingdon Island,  
Cochin-682 029, Kerala. Ph: 0484-2666845 (14 lines);  
Fax: 091-484-2668212. E-mail: [cift@ciftmail.org](mailto:cift@ciftmail.org);  
Webstie:[www.cift.res.in](http://www.cift.res.in)

**The Central Institute of Fisheries Technology (CIFT)** set up in 1954 is the only national center in the country where research in all disciplines relating to fishing and fish processing is undertaken. The institute started functioning at Cochin in 1957. Research centers function at Veraval (Gujarat), Visakhapatnam (AP), Burla (Orissa), Mumbai (Maharashtra). The institute functions to conduct basic, strategic and applied research in fishing and fish processing and works in developing designs for fuel efficient fishing vessels and fishing gear for responsible fishing and technologies for commercial isolation of bioactive compounds and industrially important products from fish and fishery wastes. The institute also designs innovative implements and machineries for fishing and fish processing and pilot plants for facilitating commercialization of technologies developed and is involved in advanced research in food safety in fish and fishery products. CIFT also provides training and consultancy services in fishing and fish processing.

## Striving to Unravel the Geological Truth

Wadia Institute of Himalayan Geology established in 1968, is an autonomous research Institute of the Department of Science & Technology, Govt. of India. Previously named as the Institute of Himalayan Geology, it was renamed as the Wadia Institute of Himalayan Geology in memory of its founder- late Prof. D.N. Wadia. In the last 40 years the Institute, while continuously striving to unravel the geological truth related to building of the majestic Himalaya, has grown into a centre of excellence and is internationally recognised as an Institute dedicated to research in Himalayan geology with well equipped laboratories and other infrastructural facilities for undertaking advance level of research in the country. The Institute at present has on its roll 64 scientists, several research students along with administration and supporting technical staff.



**The Indian Council of Agricultural Research (ICAR)** is an autonomous organisation under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture, Government of India. Formerly known as Imperial Council of Agricultural Research, it was established on 16 July 1929 as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. The ICAR has its headquarters at New Delhi.

The Council is the apex body for co-ordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. With 97 ICAR institutes and 47 agricultural universities spread across the country this is one of the largest national agricultural systems in the world.



INDIAN COUNCIL  
FOR AGRICULTURAL  
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<http://www.wihg.res.in>

Date: **10 March 2012**

<b>Theme C I</b>	<b>Ice Core for Paleo Climate, Southern Ocean and Solar Impact: Sea ice melting, Ice core studies, Southern Ocean Experiments Paleo climate studies</b>
<b>Venue</b>	IIC - Extension New Building, Seminar Hall 1&2
<b>2.30 - 4.00 pm</b>	CHAIR : Prof. John Turner, British Antarctic Survey, UK CO-CHAIR : Prof. A. K. Gwal, Barkatullah University, Bhopal
<b>Paper presentations</b>	First Stable Isotopic Study of Southern Ocean Surface Water and Atmospheric Water Vapour Prof. R. Ramesh, Project Director, Indian Space Research Organisation, Ahmedabad Ocean Iron Fertilisation an Update based on LohaFEX Experiment Dr. S. W. A. Naqvi, Scientist, National Institute Of Oceanography, Goa Arctic sea-ice --- Past, Present and Future Prof. Nalan Koc, Research Director, Norwegian Polar Institute, Norway
<b>4.00 - 4.15 pm</b>	Tea break
<b>Theme C II</b>	IIC - Extension New Building, Seminar Hall 1&2
<b>4.15 - 5.30 pm</b>	CHAIR : Dr. M. Sudhakar, Advisor, Ministry of Earth Sciences, New Delhi Co-CHAIR : Prof. Nalan Koc, Research Director, Norwegian Polar Institute, Norway
<b>Paper presentations</b>	Space Weather Impact on High Latitude Ionospheric TEC during the Low Solar Activity Period Prof. A. K.Gwal, Barkatullah University, Bhopal Twentieth Century Warming and Associated Increase in Atmospheric Pollutants at Coastal Antarctica - A case Study based on an Ice Core from the Dronning Maud Land Dr. T. Meloth, National Centre for Antarctic and Ocean Research, Goa Study of Secular Inter-annual Variations of Sea Ice Boundary of the Antarctic and the Arctic using Altimeter data in the Context to Climate Change Abhinav Srivastava, Junior Research Fellow, IIS, University of Allahabad, Allahabad

Date: **11 March 2012**

<b>Theme D I</b>	<b>Polar Atmospheric Research: Ozone depletion Meteorological Studies</b>
<b>Venue</b>	IIC - Extension New Building, Seminar Hall 1&2
<b>10.00 - 11.30 am</b>	CHAIR : Dr. Ajit Tyagi, Former Director General, IMD CO-CHAIR : Dr. S. Rajan, National Centre for Antarctic & Ocean Research, Goa
<b>Paper presentations</b>	Contrasting Climate Change in the Two Polar Regions Prof. John Turner, British Antarctic Survey, UK The atmospheric aerosols and electrical measurements over polar regions Dr. C. G. Deshpande, Indian Institute of Tropical Meteorology, Pune Investigations of the recent polar ice variations observed from the Space - borne optical and microwave sensors Dr. Sandip Oza, Space Applications Centre, Ahmedabad
<b>11.30 - 11.45 am</b>	Tea Break
<b>Theme D II</b>	IIC - Extension New Building, Seminar Hall 1&2
<b>11.45 am - 1.15 pm</b>	CHAIR : Dr. L. S. Rathore, Director General, India Meteorological Department, New Delhi CO-CHAIR : Prof. R. Ramesh, Project Director, Indian Space Research Organisation, Ahmedabad
<b>Paper presentations</b>	Reduction in Arctic - Antarctic Thermal Contrast and Decline in Asia - Pacific Monsoon Intensity and All - India Monsoon Rainfall Dr. Nityanand Singh, Indian Institute of Tropical Meteorology, Pune

Inner- Seasonal Variabilities in an Arctic fjord: The Kongsfjorden System as a natural laboratory for climate change

Dr. S. Rajan, National Centre for Antarctic & Ocean Research, Goa

Temperature Variations at Schirmacher OASIS and Larsemann Hills during last two decades

R. P. Lal and Dr. Ajit Tyagi, India Meteorological Department, New Delhi

Atmospheric Aerosols studies over Arctic: Initiatives for long term data and Preliminary Results

Jai Prakash Chaubey, Senior Research Fellow, SPL-VSSC, Trivandrum

1.15 - 2.00 pm

Lunch break

## Theme E

### Geology: Geophysical Studies Glacial and Fluvial Environment Southern Ocean and Marine Environments

Venue

IIC - Extension New Building, Seminar Hall 1&2

2.00 - 3.30 pm

CHAIR : Rasik Ravindra, Director, National Centre for Antarctic & Ocean Research, Goa

CO-CHAIR : Prof. S. K. Tandon, Former Pro Vice Chancellor, Delhi University

Paper presentations

Comparison and Replicability of Ground Penetrating Radar Surveys for Detailed Glaciological Investigations between the Polar and Himalayan Regions

Prof. John M. Reynolds , MD Reynolds International Limited, UK

Glacier Mass Balance Studies in Vestre Brøggerbreen, Svalbard Region

Prof. AL. Ramanathan, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi

Who Controls Seabed Mineral Resources in the Antarctic and the Antarctic Ocean

Dr. M. Sudhakar, Advisor, Ministry of Earth Sciences, Govt. of India

Recent Retreat of Himalayan Glaciers as Evidence of Climate Change; Observation and Analyses

Dr. D. P. Dobhal, Scientist, WIHG, Dehradun

Evolution of Rocky Oases in East Antarctica Study by Indian Scientists

Rasik Ravindra, Director, National Centre for Antarctic & Ocean Research, Goa

3.30 - 4.00 pm

Tea Break

Date: **11 March 2012**

CONCLUDING

### Summary and Valedictory Function

Venue

IIC - Extension New Building, Seminar Hall 1&2

4.00 - 5.00 pm

Presided by **Dr. B. Meenakumari**, Deputy Director General (Fisheries), Indian Council of Agricultural Research, New Delhi

Observations by Prof. Anand Mohan, Registrar, Dayalbagh Educational Institute (Deemed University), Dayalbagh, Agra

Observations by Dr. Swati Basu, Scientist G, Advisor, Dr. S. Sudhakar, Advisor, Ministry of Earth Sciences, Government of India

Observations by Dr. M. Sudhakar, Advisor, Ministry of Earth Sciences, Govt. of India

Valedictory Address by Rasik Ravindra, Chairman, Organising Committee, Director, National Centre for Antarctic & Ocean Research, Goa

Convenor's Address by Sulagna Chattopadhyay, President, LIGHTS, Convenor i-SaGAA 2012

The **Ministry of Earth Sciences (MoES)**, formerly known as **Department of Ocean Development (DOD)** was established in 1981 with the mandate to create a **deeper understanding** of the **oceanic** regime of the **northern** and **central Indian Ocean** and also **develop** technology and **technological aids** for harnessing of resources and understanding of various **physical, chemical** and **biological** processes in the **icy realms** of **Arctic** and **Antarctic**. In 2006 **India Meteorological Department (IMD)**, established in **1876** to provide **meteorological** service to the **country**, was **integrated** with MoES by bringing **meteorological** agencies and **ocean development** department under **one umbrella** considering the **importance** of **ocean atmospheric interfaces**. The MoES, aims at looking at the **planet** in a **holistic way** in as much as **understanding** of interplay of **earth dynamics** and **systems phenomenon**.



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